

INTERNATIONAL TRADE

Title: Chlortetracycline, Oxytetracycline, Tetracycline and Bacitracin Tissue Residue Studies in Swine Conducted in Reference to Foreign Export Markets – **NPB #09-257**

Investigator: Mike Apley, DVM, PhD, DACVCP

Institution: PharmCATS Bioanalytical Services, Department of Clinical Sciences
College of Veterinary Medicine, Kansas State University

Analyst: Gary Griffith, PhD

Bacitracin in-life phase: Locke Karriker, DVM, MS, DACPVM Iowa State University

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Scientific Abstract:

The objective of this study was to describe tissue residues of chlortetracycline, oxytetracycline, and tetracycline in slaughter hogs and also bacitracin in sows.

In the tetracycline category study, 5 groups of pigs received the following treatments. (1) Chlortetracycline in the water calculated to deliver 10 mg/lb body weight daily for 5 days, (2) Oxytetracycline in the water calculated to deliver 10 mg/lb body weight daily for 5 days, (3) Tetracycline in the water calculated to deliver 10 mg/lb body weight daily for 5 days, (4) Chlortetracycline in the feed calculated to deliver 10 mg/lb body weight daily for 14 days, and (5) Oxytetracycline in the feed calculated to deliver 10 mg/lb body weight daily for 14 days. Bacitracin was fed at 750 g/ton in 5 lbs of feed daily to the cull sows.

For the tetracyclines, the residues were monitored at 0, 7, 14, 21, and 28 days after ending the treatments. The pigs weighed approximately 91 kg on day 0, and 123 kg on day 28. Bacitracin was monitored at 0 and 7 days withdrawal. Samples collected included muscle, liver, kidney, and fat. Additional samples in the tetracycline groups included plasma, urine, colon contents (at 21 and 28 days only), and bone (21 and 28 days only). Residue analysis was by HPLC/MS/MS using an API 4000 detector. Assays were developed in the study laboratory and are not approved regulatory methods.

These research results were submitted in fulfillment of checkoff-funded research projects. This report is published directly as submitted by the project's principal investigator. This report has not been peer-reviewed.

For more information contact:

National Pork Board • PO Box 9114 • Des Moines, IA 50306 USA • 800-456-7675 • Fax: 515-223-2646 • pork.org

Results for the tetracyclines: All edible tissues rapidly decreased in residue concentrations from withdrawal day 0 to withdrawal day 7. Concentrations in the muscle at 28 days withdrawal time for chlortetracycline, oxytetracycline, and tetracycline ranged from detectable to 12.0 ppb, detectable to 9.9 ppb, and 12.5 to 26.9 ppb respectively. Calculated muscle residue elimination half-lives from withdrawal day 7 to withdrawal day 28 were 18.0, 31.6, and 118.5 days for chlortetracycline, oxytetracycline, and tetracycline respectively.

Bone samples displayed prolonged residues, which may be a major component of the persistent, low-level residues demonstrated in this study. Bone concentrations were detected in all samples for all treatment groups at 28 days, with the highest being chlortetracycline, ranging from 375 to 1120 ppb. Colon contents and urine displayed quantifiable residues for all treatment groups in at least some pigs at 21 and 28 days withdrawal depending on the group. The high initial manure concentrations at 0 withdrawal time, and the persistent manure and urine contributions to the pen floor environment, could contribute to recycling of drug in environments where manure consumption is possible.

Bacitracin results: Bacitracin was fed to sows at a rate of 750 g/ton in 5 lbs of feed daily for 2 weeks. Residues were detected (LOD 38 ppb) in one muscle sample at 0 days withdrawal and two samples at 7 days withdrawal. Multiple liver samples had detected or quantifiable concentrations at 0 and 7 days withdrawal (LOD 97 ppb, LOQ 292 ppb).